



Autonomous Decision-Making

National Pediatric Nighttime Curriculum

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Learning Objectives

- Upon completion of this module, the learner will be able to independently:
 - Identify key features of a patient history and apply abstract qualifiers to describe the key features to synthesize a concise problem representation
 - Construct an accurate patient assessment
 - Formulate a therapeutic plan
 - Organize a case presentation using the PBAR method (Problem Representation, Background, Analysis, Recommendations) to trigger the decision-making process*

*The PBAR framework was developed by Mary Ottolini, MD by modifying the SBAR (Situation, Background, Assessment, Recommendation) model.



Definitions

- Problem Representation—A case presentation that transforms the patient's story into a meaningful clinical problem or a brief summary defining the case in abstract terms¹
- Key Features—Elements of the story such as signs and symptoms that link to specific categories or diagnoses and distinguish one diagnoses from another^{1,2}
- Abstract Qualifiers (i.e. semantic qualifiers)—Paired, opposing descriptors or adjectives that can be used to compare and contrast diagnostic considerations¹



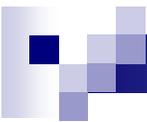
Definitions

- Clinical Reasoning—synonymous with problem-solving, decision-making, and judgment: The processes clinicians use to interpret data to make decisions regarding patient management^{2,3}
- Illness scripts—networks of organized knowledge recalled by expert clinicians to process information and progress toward solutions to clinical problems⁴. The PBAR method is organized to trigger “illness scripts”.
- ROWS (rule-out worse case scenario)—A decision-making strategy, often used by emergency physicians, to avoid missing critical diagnoses characterized by a form of pattern matching of the top 5 or so diagnoses that need to be excluded for any given clinical presentation⁵



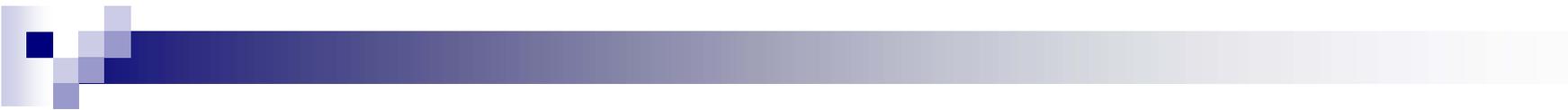
The Case of Hailey

- Hailey is an 18 month old female who was brought to the ED by her parents because they are worried about her rash. She started having this rash all over her body about 2 days ago. It is red and they think she might be allergic to something. Hailey has also been having fevers for about the same time as the rash. The fevers don't go away, even when they give her acetaminophen or ibuprofen. She has also been much more fussy than usual. She threw up a couple of times, mostly milk.



Key Features in The Case of Hailey

- Hailey is an 18 month old female who was brought to the ED by her parents because they are worried about her **rash**. She started having this rash **all over her body** about 2 days ago. It is **red** and they think she might be allergic to something. Hailey has also been having **fevers** for about the same time as the rash. The fevers **don't go away**, even when they give her acetaminophen or ibuprofen. She has also been much more **fussy** than usual. She **threw up** a couple of times, mostly milk.



The Case of Hailey Continues

- Hailey has had multiple urine infections because she has a duplicated renal collecting system with some hydronephrosis. She has even had pseudomonas infection in her urine. The most recent antibiotic use was over 3 months ago, and she has not taken antibiotics since then. She is not on any medications. The only time she has been in the hospital was for the pseudomonas UTI because she needed IV antibiotics. She lives with her parents and 4 year old brother in the city. She attends daycare as both of her parents work outside the home. No one else in her family is sick but the family is unsure if any children at daycare are ill. Her family is healthy.



The Case of Hailey Continues

- PE: VS: Tm 103.5 RR 32 HR 140 BP 102/54 O2 sat 97%RA
- GEN: awake, makes eye contact, crying constantly, will not calm down, even with her parents comforting her
- HEENT: bilateral scleral injection, no purulent drainage, MMM, OP clear, mucus membranes are erythematous, injected and dry, strawberry tongue
- Neck: supple, FROM, 2 cm single, non-tender anterior left sided lymph node
- RESP: CTAB, no WCR
- CV: RRR no MRG ABD: soft belly, NTND, no HSM, no rebound/guarding
- EXT: WWP, mild edema to both hands/wrists
- NEURO: moves all extremities



The Case of Hailey Continues

- PE: VS: **Tm 103.5** RR 32 **HR 140** BP 102/54 O2 sat 97%on RA
- GEN: awake, makes eye contact, **crying constantly, will not calm down**, even with her parents comforting her
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Reorganizing the Case of Hailey

- Problem Representation

- *Hailey is an 18 month old female with acute onset, erythematous, generalized rash and high-grade fever.*

- Background

- *ROS is positive for emesis and fussiness. She has a history of a duplicated renal system and recurrent UTIs, and the most recent antibiotic was use 3 months ago. She has no known sick contacts. On exam, she is febrile, tachycardic, irritable, has bilateral non-exudative conjunctivitis, a single, non-tender, large cervical lymph node, mucocutaneous changes, and mild distal upper extremity edema.*

- Analysis

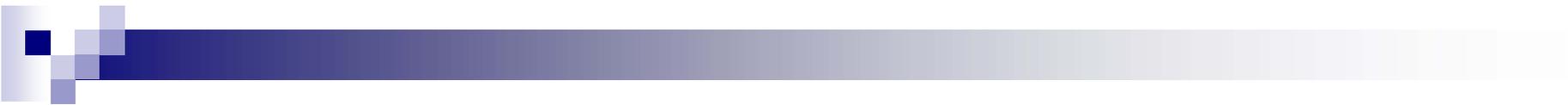
- *Hailey's symptoms are most likely due to Kawasaki's disease, although there are viruses such as adenovirus which can cause similar symptoms. I am concerned about meningitis because of her fever and irritability, although this is less likely.*

- Recommendations



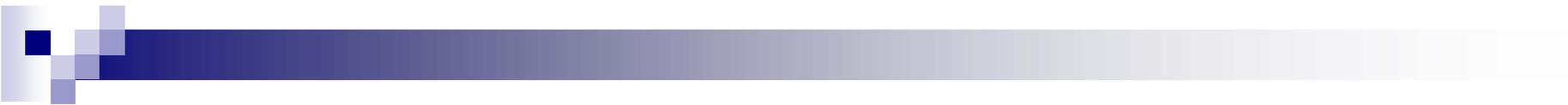
PBAR: Problem Representation

- Key Features
 - Trigger “illness scripts”
 - Focus on reason for admission/hospitalization
- Abstract Qualifiers
 - Examples: flaccid/spastic, high-grade/low-grade, acute/chronic, firm/soft, recurrent/discrete
 - Transform patient-specific details into abstract terms
 - “Last night” → acute onset
 - “I’ve had this problem before” → recurrent
 - “Joint pain in the same knee” → monoarticular
- String the key feature abstractions into one sentence (occasionally 2-3 sentences)
- This represents the HPI or subjective portion of a progress note



PBAR: Background

- Review of Systems
- Past Medical History
- Social History
- Family History
- Physical Exam including Vital Signs
- Laboratory Data
- Radiographic Data
- Course/Work-up done prior to hospitalization



PBAR: Analysis

- 2-3 most likely diagnoses
- You may generate a longer DDx, but eliminate the ones that do not fit the patient's age and presentation
- Rank the differential diagnosis
- Compare and contrast the diagnoses
- Include ROWS
- Address clinical progress (i.e., improving, deteriorating, stable etc)



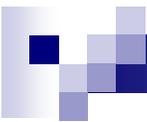
PBAR: Recommendations

- Diagnostic goals/management
- Therapeutic goals/management
- Identify issues for self-study based on Evidence-Based Medicine
 - Perform quick literature searches on diagnoses or problems that are new
- Prioritize issues that can wait until morning and those that need immediate attention
- Address discharge goals and discharge criteria



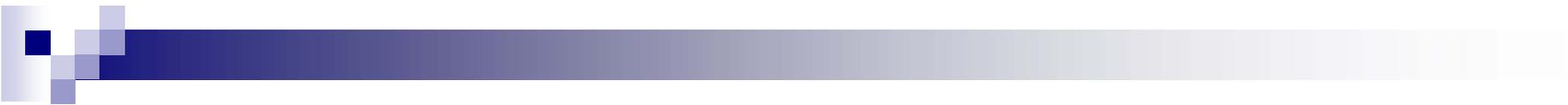
The Case of Nick

- Nick is an 8 month old boy brought in by his mother who feels he was not acting right when she came home from working the night shift. He has not been able to wake up. When he does wake up all he does is cry. Before she left for work Nick was acting fine and ate his dinner with no problems. Nick's dad said that he vomited once and he could not get him to stop crying so he just put him to bed. He continued to either cry or sleep but nothing happened that he knows. Nick's dad did not come to the emergency department with the mom as he is at home with the other child who is healthy. The medications in the house are up too high for the baby to reach. He hasn't had a cough or a cold. Though he feels warm she does not think he has had a fever. He has been healthy except for an episode six weeks ago when Nick had something similar but when they were seen in the ED the doctor did not find anything wrong and Nick got better.
- *Physical Exam:*
- Vitals: T 37.2 RR 36 P 160 BP 110/50 O2 Sat 98% RA
- Wt 8.8 kg (50%ile), Ht 71 cm (50%ile), HC 47 cm (75%ile)
- General: Alternates between crying and sleeping
- HEENT: Anterior fontanel is bulging. Scant bleeding from the frenulum.
- Neck: Supple
- RESP: Clear breath sounds with good air entry
- CV: RRR. No murmur. Capillary refill 3 seconds.
- GI: Tanner I
- NEURO: Awakens when stimulated but cries. Unable to sit unsupported. Moves all four extremities well and equally. 3+ reflexes bilaterally.
- SKIN: Red discoloration and edema over the back of the head



The Case of Nick--Reorganized

- Problem Representation
 - *Nick is a previously healthy 8 month old male infant with acute onset waxing and waning altered mental status and a single episode of vomiting.*
- Background
 - *Nick has no significant PMH. He had a similar, self-limited episode earlier with no clear diagnosis. Nick was under the care of his father when he became symptomatic but was brought in by his mother after she got home from work. He has a healthy sibling at home. Exam is significant for stable vital signs, increased head circumference, alternating lethargy and irritability, bulging fontanel, bleeding frenulum, and occipital scalp hematoma.*
- Analysis
 - *I am most concerned that Nick's change in mental status is due to abusive head trauma based on his bulging fontanel and bleeding frenulum in the absence of a history of trauma. Meningitis or encephalitis is also possible but less likely as he has not been febrile. Toxic ingestion can also cause altered mental status but it would be unlikely in a non-ambulatory infant.*
- Recommendations
 - *I would like to order a STAT head CT, a skeletal survey, and make the baby NPO, and possibly transfer to PICU if he worsens. I would like to monitor his neurological exam very closely and may need to consult neurosurgery depending on the findings of the CT. I plan to read more about the management of the child with suspected physical abuse to determine any further work-up. In the morning, the day team can consult the child-abuse team and child protective services if our work-up reveals evidence of abusive injury. If the child becomes febrile or the head CT is negative tonight, I plan do perform an LP and a toxicology screen.*



Conclusions

- The PBAR method is a novel way to construct case presentations that trigger the process clinicians use to make decisions regarding patient management .
- A concise problem representation of a clinical scenario is constructed using key features and abstract qualifiers
- A patient analysis involves generating a focused, ranked differential where the diagnoses are compared and contrasted.
- A therapeutic plan should be prioritized, based on the evidence, and include identifying issues for self-study.



References

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4. Fournier JP, Demeester A, Charlin B. Script concordance tests: guidelines for construction. *BMC Medical Informatics and Decision-Making*. 2008; 8:18.
5. Croskerry P. Achieving quality in clinical decision-making: cognitive strategies and detection of bias. *Academic Emergency Medicine*. 2002;9:1184-1204.